Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1 – 35. Cancelled.

36. (Currently amended) An ultrasound apparatus comprising:

an ultrasound transmitter;

two or more receivers that form a receiver array wherein the receiver array and the transmitter are concentric about a line that passes through a focal point of the receiver array and the transmitter and wherein the line is perpendicular to a plane in which the receiver array and the transmitter are disposed, and wherein the receiver array is adapted to detect simultaneously the reflected ultrasound energy from both ~~a cortical and a trabecular~~ cortical and trabecular portions of a bone target; and

a processor connected to the transmitter and receivers of the ultrasound apparatus, wherein the processor calculates one or more reflected spectra from each receiver and calculates from the spectra [[~~a~~]] critical angles for the cortical and the trabecular portions of the bone target.

37. (Previously amended) The ultrasound apparatus of claim 36, wherein the transmitter is concave in at least two dimensions.

38. (Previously amended) The ultrasound apparatus of claim 36, wherein the two or more receivers form part of a concave array in at least two dimensions.

39. (Previously amended) The ultrasound apparatus of claim 36, wherein the transmitter and the two or more receivers are concave and concentric.

40. (Previously amended) The ultrasound apparatus of claim 36, wherein the transmitter is concave and the two or more receivers are concave and the transmitter and the two or more receivers are concentric about a common focal point.

41. (Previously amended) The ultrasound apparatus of claim 36, wherein the receivers are further defined as a receiving array and the array comprises 2, 4, 8, 16, 24, 36, 48, 64 or 128 independent receivers.

Claim 42. (Currently amended) The ultrasound apparatus of claim 36, wherein the array system is comprised of a single transmitter and a 48-element receiver array located in a housing connected to a processor, wherein the receiver array ~~simultaneously~~ detects simultaneously an ultrasound wave across 120 degrees from a point of examination that is at or about the focal point of the transmitter and the processor calculates and displays the ultracritical angle of the ultrasound wave.

43. (Previously amended) The ultrasound apparatus of claim 36, further comprising a housing for the transmitter and the at least two receivers, the housing having at least one opening at or about the focal point of the transmitter and receivers.

44. (Previously amended) The ultrasound apparatus of claim 36, further comprising:

a housing for the transmitter and the at least two receivers, the housing having at least one opening;

a latex membrane at or about the opening of the housing; and

an ultrasound conductive material within the housing.

45. (Previously amended) The ultrasound apparatus of claim 44, wherein the ultrasound conductive material comprises water.

46. (Currently amended) The ultrasound apparatus of claim 36, further comprising a computer-controlled positioning arm connected to the ultrasound apparatus, wherein movement of the ultrasound apparatus permits accurate positioning of the ultrasound apparatus ~~device~~ on a point of examination.

47. (Previously amended) The ultrasound apparatus of claim 44, further comprising a pressure detector in communication with the ultrasound conductive material, which detects the increase in pressure within the housing that may break the latex membrane.

48. (Previously amended) The ultrasound apparatus of claim 36, further comprising at least one computer comprising the processor connected to the transmitter and receivers of the ultrasound apparatus, the computer comprising at least one code segment that displays the spectra for the critical angles for the cortical and the trabecular bone.

49. (Previously amended) The ultrasound apparatus of claim 48, wherein the computer

further comprises at least one code segment that determines critical-angle velocities, and fits them to a linear-quadratic equation for the determination of at least two principal coefficients of elasticity.

50. (Currently Amended) An ultrasound critical angle reflectometer comprising:

an ultrasound transmitter; and

two or more receivers that form a receiver array wherein the receiver array and the transmitter are concentric about a line that passes through a focal point of the receiver array and the transmitter and wherein the line is perpendicular to a plane in which the receiver array and the transmitter are disposed, wherein the focal point is targeted to be a bone, and wherein the receiver array is adapted to detect simultaneously the reflected ultrasound energy from a portion of the bone target at multiple angles including a normal; and

a processor connected to the transmitter and receivers of the ultrasound critical angle reflectometer, wherein the processor processes one or more reflected spectra from each receiver to calculate [[a]] critical angles for ~~a cortical and a trabecular~~ cortical and trabecular region of the bone target.

51. (Previously amended) The ultrasound apparatus of claim 50, wherein the transmitter is concave in at least two dimensions.

52. (Previously amended) The ultrasound apparatus of claim 50, wherein the receiver array comprises a concave array in at least two dimensions.

53. (Currently amended) The ultrasound apparatus of claim 50, wherein the receiver array comprises 2, 4, 6, 12, 24, 36 or 48 independent receivers ~~receiving ultrasound apparatuses~~.

54. (Currently Amended) The ultrasound apparatus of claim 53, wherein the ultrasound apparatus comprises a single transmitter and the receiver array connected to the processor, wherein the receiver array detects simultaneously an ultrasound wave across 120 degrees from a point of examination that is at or about the focal point of the transmitter and the processor calculates a velocity of the ultrasound wave and ~~display~~ displays the velocity data.

55. (Previously amended) The ultrasound apparatus of claim 50, further comprising a housing for the transmitter and the receiver array, the housing having at least one opening at, about or

adjacent to, the focal point of the transmitter and receiver array.

56. (Currently amended) The ultrasound apparatus of claim 50, further comprising:

a housing for the transmitter and the ~~at least two~~ receivers, the housing having at least one opening;

a latex membrane at or about the opening of the housing; and

an ultrasound conductive material within the housing.

57. (Previously amended) The ultrasound apparatus of claim 56, wherein the ultrasound conductive material comprises water.

58. (Currently amended) The ultrasound apparatus of claim 50, further comprising a computer-controlled positioning arm connected to the ultrasound apparatus, wherein movement of the ultrasound apparatus permits accurate positioning of the ultrasound apparatus ~~device~~ on a point of examination.

59. (Currently amended) The ultrasound apparatus of claim 50, further comprising a pressure detector positioned to contact the ultrasound conductive material which detects when excessive pressure is applied to ~~the~~ a latex membrane enclosing ultrasound ~~conducive~~ conductive material within the housing.

60. (Previously amended) The ultrasound apparatus of claim 50, further comprising at least one computer connected to the transmitter and the receiver array.

61. (Previously amended) The ultrasound apparatus of claim 60, wherein the computer comprises at least one code segment that gathers one or more reflected spectra from the receiver array and calculates from the spectra one or more critical angles for a cortical and a trabecular bone.

62. (Previously amended) The ultrasound apparatus of claim 60, wherein the computer comprises at least one code segment that determines critical angle velocities, and fits the critical angle velocity to a linear-quadratic equation for the determination of at least two principal coefficients of elasticity.

63 – 86. (Cancelled)

87. (Currently amended) A method for non-invasively, in vivo and simultaneously determining a maximum and minimum elasticity coefficients and an anisotropy of a cortical and a trabecular bone target comprising the steps of:

measuring a critical angle from the cortical and the trabecular bone target using an ultrasound apparatus comprising:

an ultrasound transmitter;

two or more receivers that form a receiver array wherein the receiver array and the transmitter are concentric about a line that passes through a focal point of the receiver array and the transmitter and wherein the line is perpendicular to a plane in which the receiver array and the transmitter are disposed, and wherein the receiver array is adapted to detect simultaneously the reflected ultrasound energy from ~~a cortical and a trabecular~~ cortical and trabecular portions of a bone target; and

a processor connected to the transmitter and receivers of the ultrasound apparatus, wherein the processor calculates one or more reflected spectra from each receiver and calculates from the spectra [[~~a~~]] critical angles for the cortical and the trabecular portions of the bone target; and

deriving the maximum and the minimum elasticity coefficients and the anisotropy of the cortical and the trabecular bone targets.

88. (Currently amended) A method for non-invasively, in vivo, and simultaneously determining a maximum and minimum elasticity coefficients and an anisotropy of a cortical and a trabecular bone target comprising the steps of:

measuring a critical angle from the cortical and the trabecular bone target using an ultrasound critical angle reflectometer comprising:

an ultrasound transmitter; and

two or more receivers that form a receiver array wherein the receiver array and the transmitter are concentric about a line that passes through a focal point of the receiver array and the transmitter and wherein the line is perpendicular to a plane in which the receiver array and the transmitter are disposed, wherein the focal point is targeted to be a bone, and wherein the

receiver array is adapted to detect simultaneously the reflected ultrasound energy from a portion of the bone target at multiple angles including a normal; and

a processor connected to the transmitter and receivers of the ultrasound critical angle reflectometer, wherein the processor processes one or more reflected spectra from each receiver to calculate [[a]] critical angles for ~~a cortical and a trabecular~~ cortical and trabecular regions of the bone target; and

deriving the maximum and the minimum elasticity coefficients and the anisotropy of the cortical and the trabecular bone targets.

89. (Cancelled).